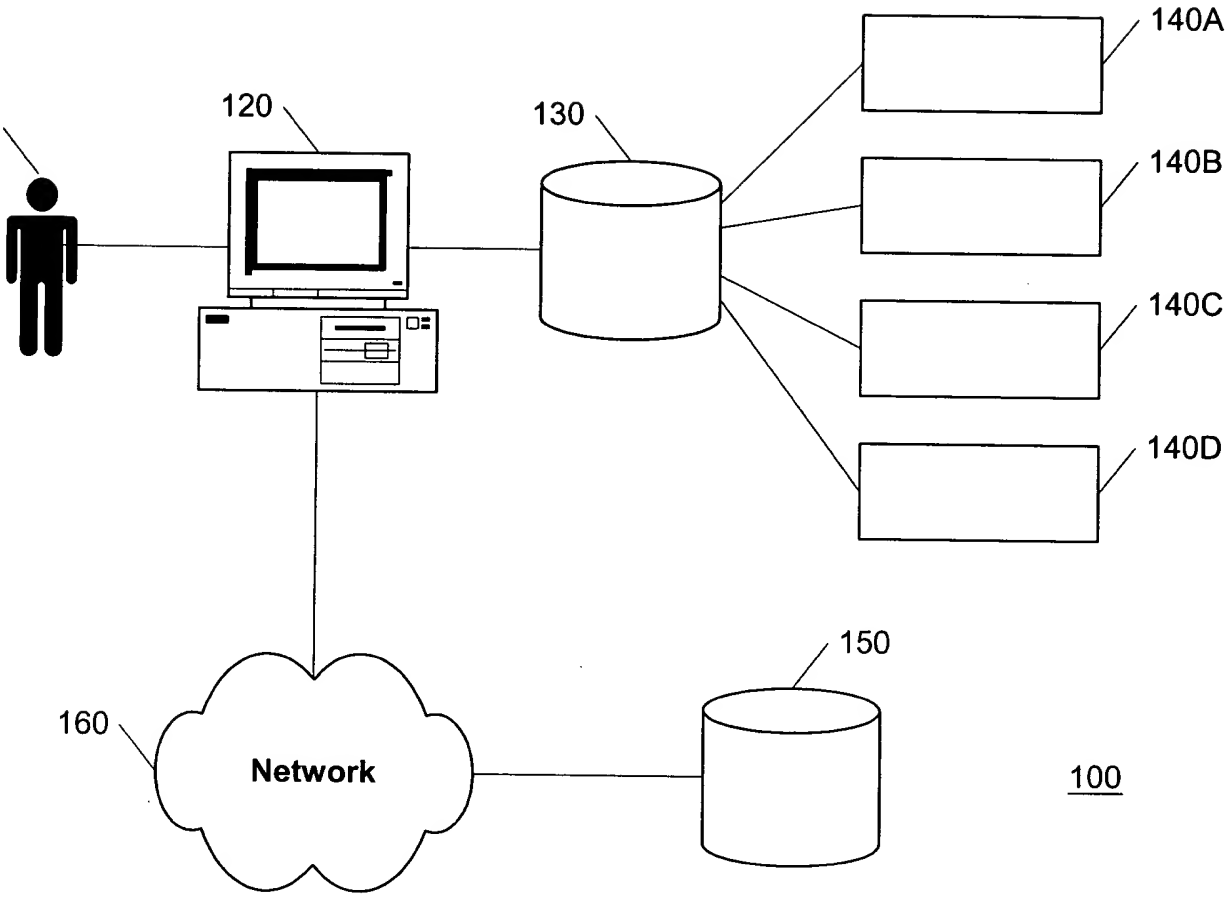


FIG. 1

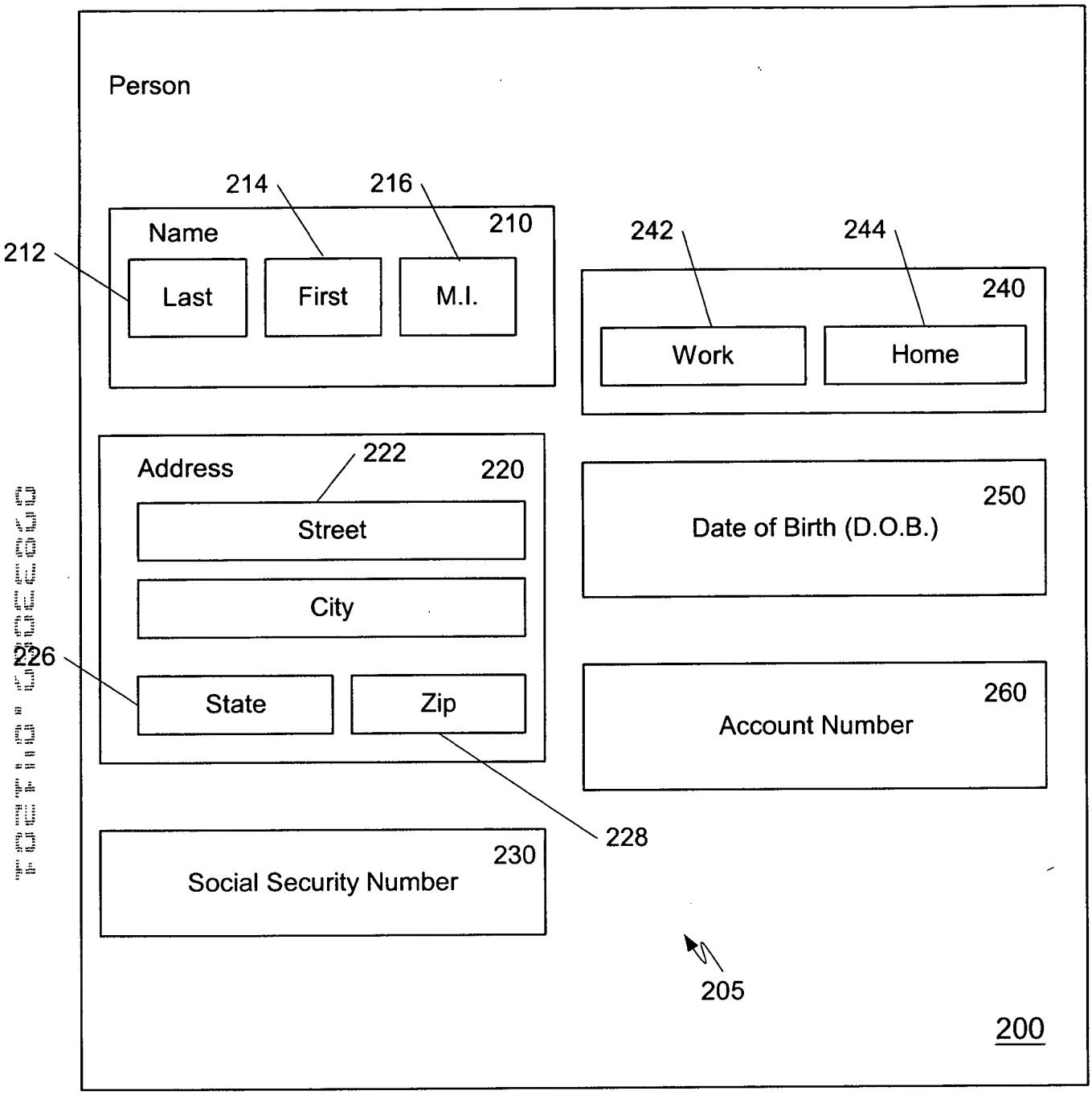

Person
214
216
210
Name
212
Last
First
M.I.
242
244
240
Work
Home
Address
222
220
Street
City
226
State
Zip
250
Date of Birth (D.O.B.)
260
Account Number
228
230
Social Security Number
205
200

FIG. 2

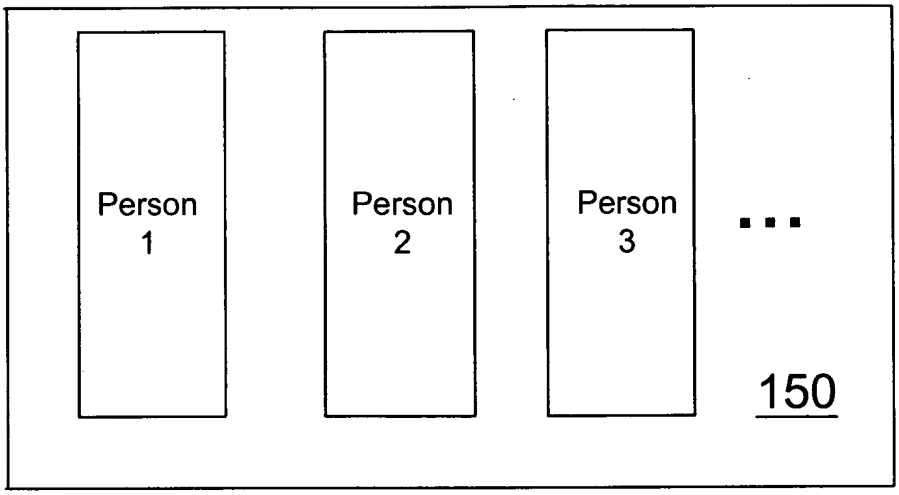

Person 1
Person 2
Person 3
150

FIG. 3A

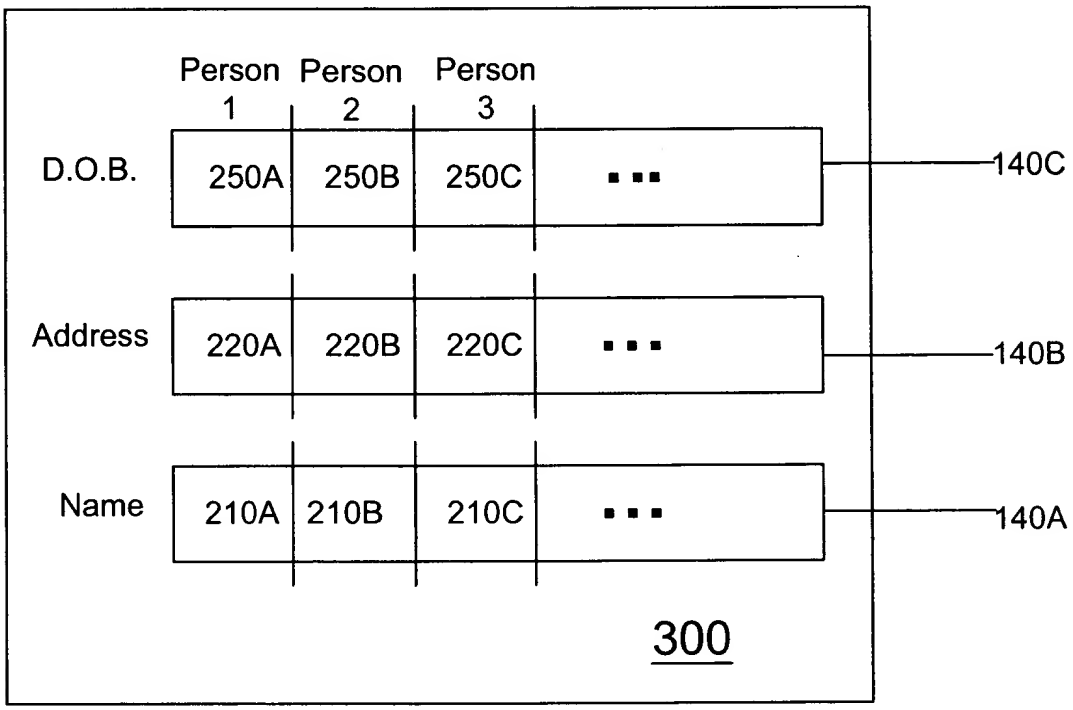

Person 1
Person 2
Person 3
D.O.B.
250A
250B
250C
Address
220A
220B
220C
Name
210A
210B
210C
140C
140B
140A
300

FIG. 3B

	COLORS
1	PINK
2	ORANGE
3	GREEN
4	BLUE
5	PURPLE

410

	SHAPES
1	STARS
2	HORSESHOES
3	DIAMONDS
4	HEARTS
5	CLOVERS

420

FIG. 4A

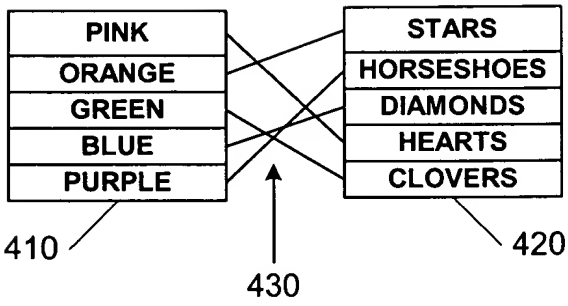


FIG. 4B

440

PINK	HEARTS
ORANGE	STARS
GREEN	CLOVERS
BLUE	DIAMONDS
PURPLE	HORSESHOES

410 420

FIG. 4C

450

STARS	ORANGE
HORSESHOES	PURPLE
DIAMONDS	BLUE
HEARTS	PINK
CLOVERS	GREEN

420 410

FIG. 4D

460

1	4
2	1
3	5
4	3
5	2

410 420

FIG. 4E

470

1	2
2	5
3	4
4	1
5	3

420 410

FIG. 4F

4
1
5
3
2

420

FIG. 4G

2
5
4
1
3

410

FIG. 4H

FIG. 5

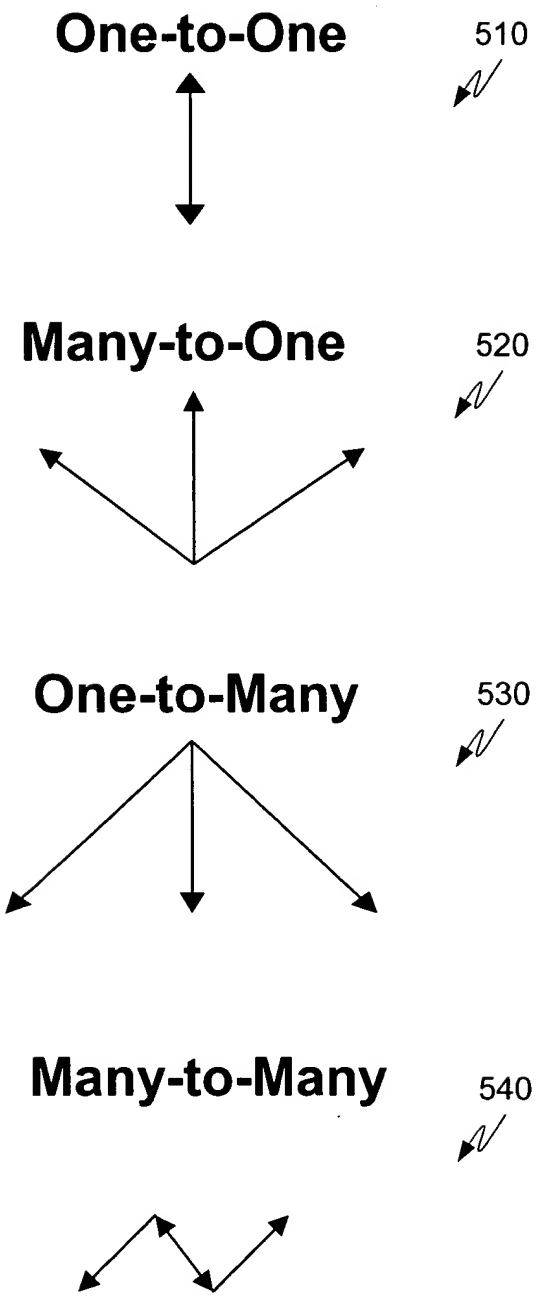


FIG. 6

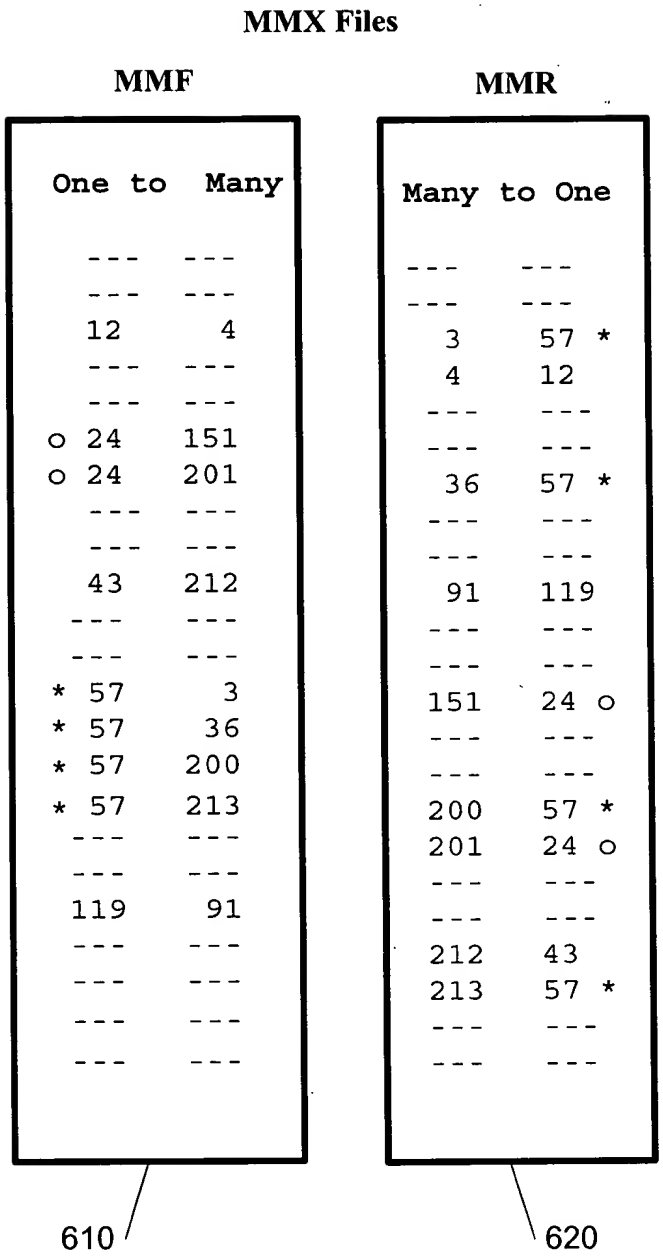

MMX Files
MMF
One to Many
--- ---
--- ---
12 4
--- ---
--- ---
o 24 151
o 24 201
--- ---
--- ---
43 212
--- ---
--- ---
* 57 3
* 57 36
* 57 200
* 57 213
--- ---
--- ---
119 91
--- ---
--- ---
--- ---
--- ---
610
MMR
Many to One
--- ---
--- ---
3 57 *
4 12
--- ---
--- ---
36 57 *
--- ---
--- ---
91 119
--- ---
--- ---
151 24 o
--- ---
--- ---
200 57 *
201 24 o
--- ---
--- ---
212 43
213 57 *
--- ---
--- ---
620

FIG. 7

MMX Files

MMF

Many to Many'		
---	---	
---	---	
7	256	
* 8	38	+
* 8	21	
* 8	312	
---	---	
---	---	
19	317	
---	---	
---	---	
35	38	+
36	70	
---	---	
---	---	
58	38	+
---	---	
---	---	
o 112	71	
o 112	38	+
113	316	
---	---	
---	---	

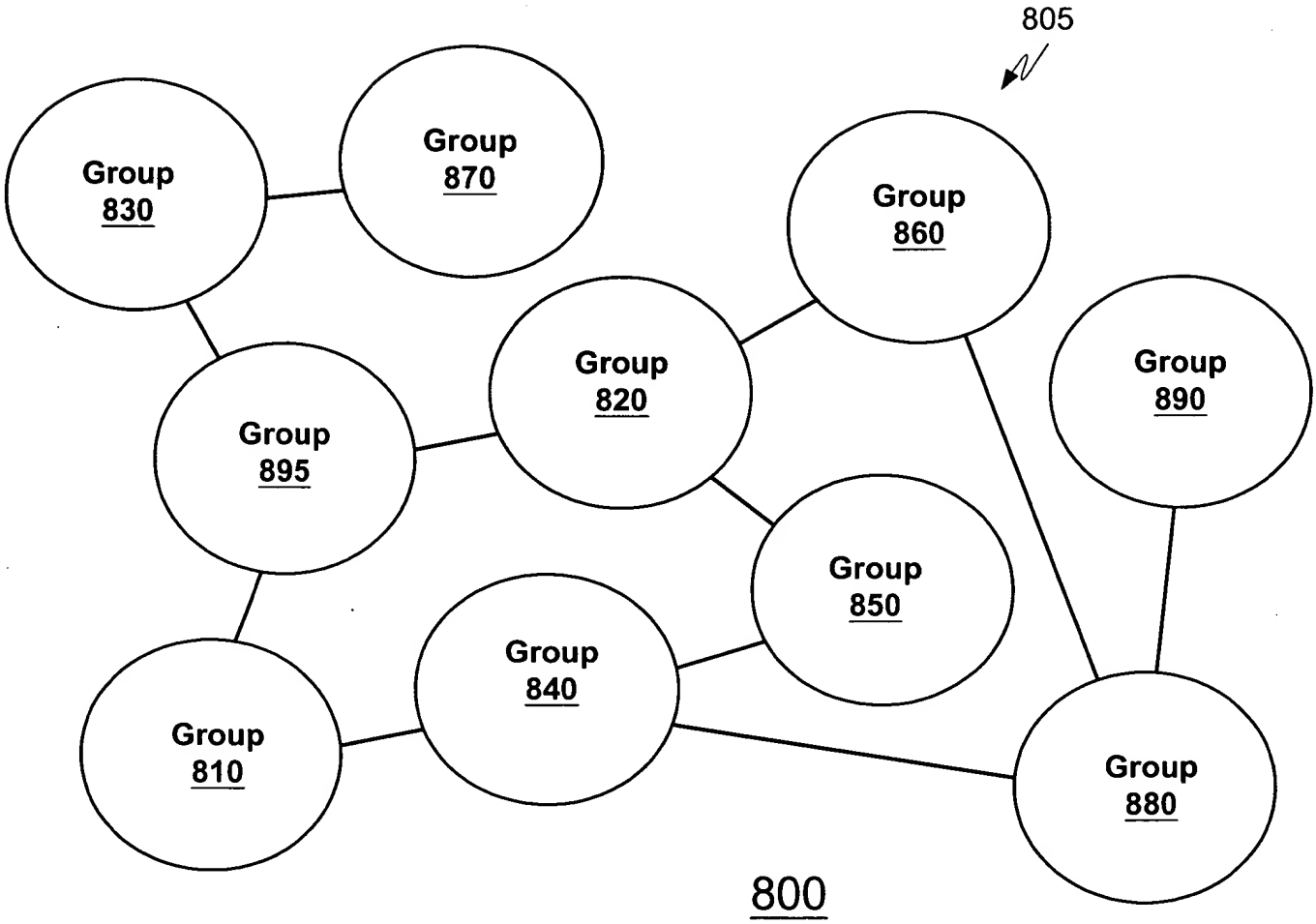
710

MMR

Many' to Many		
---	---	
---	---	
21	8	*
---	---	
---	---	
+ 38	8	*
+ 38	35	
+ 38	58	
+ 38	112	o
---	---	
---	---	
70	36	
71	112	o
---	---	
256	7	
---	---	
---	---	
312	8	*
---	---	
---	---	
316	113	
317	19	
---	---	
---	---	

720

FIG. 8


805
Group 830
Group 870
Group 860
Group 820
Group 890
Group 895
Group 850
Group 840
Group 810
Group 880
800

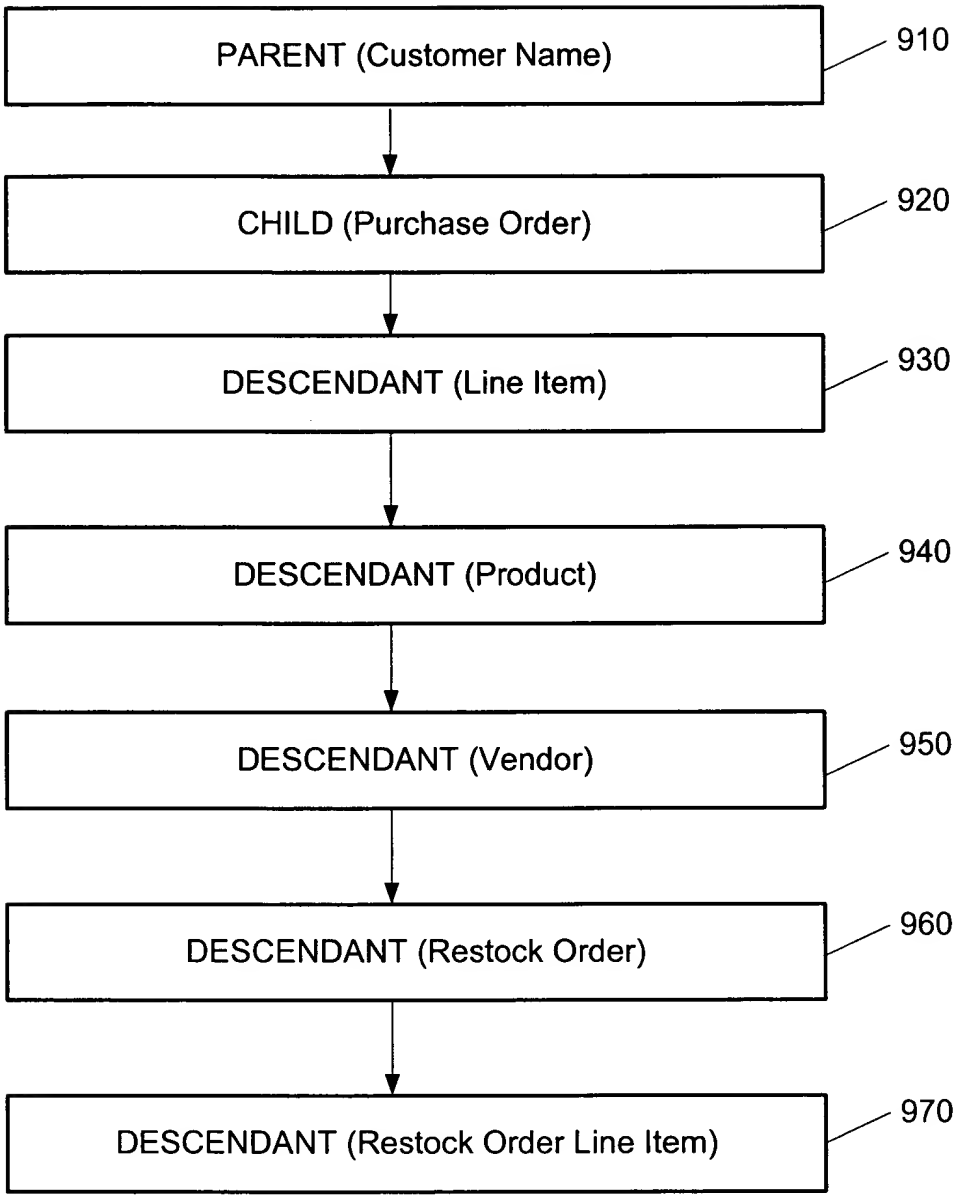

PARENT (Customer Name)
910
CHILD (Purchase Order)
920
DESCENDANT (Line Item)
930
DESCENDANT (Product)
940
DESCENDANT (Vendor)
950
DESCENDANT (Restock Order)
960
DESCENDANT (Restock Order Line Item)
970

FIG. 9

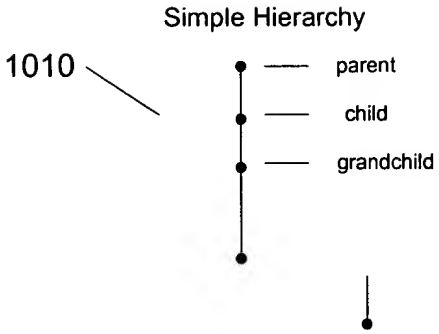


FIG. 10A

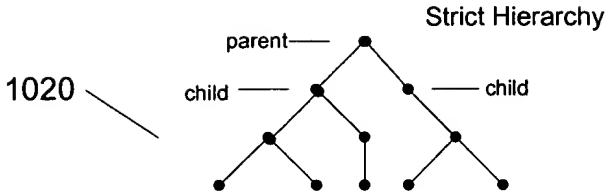


FIG. 10B

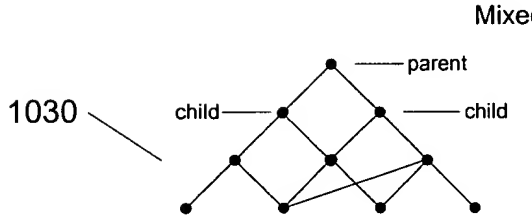


FIG. 10C

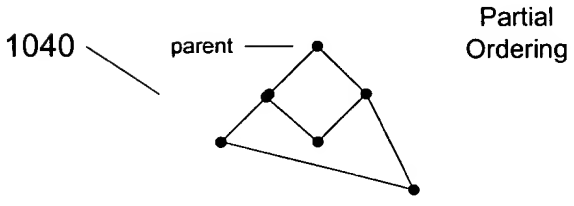


FIG. 10D

Fig.11A

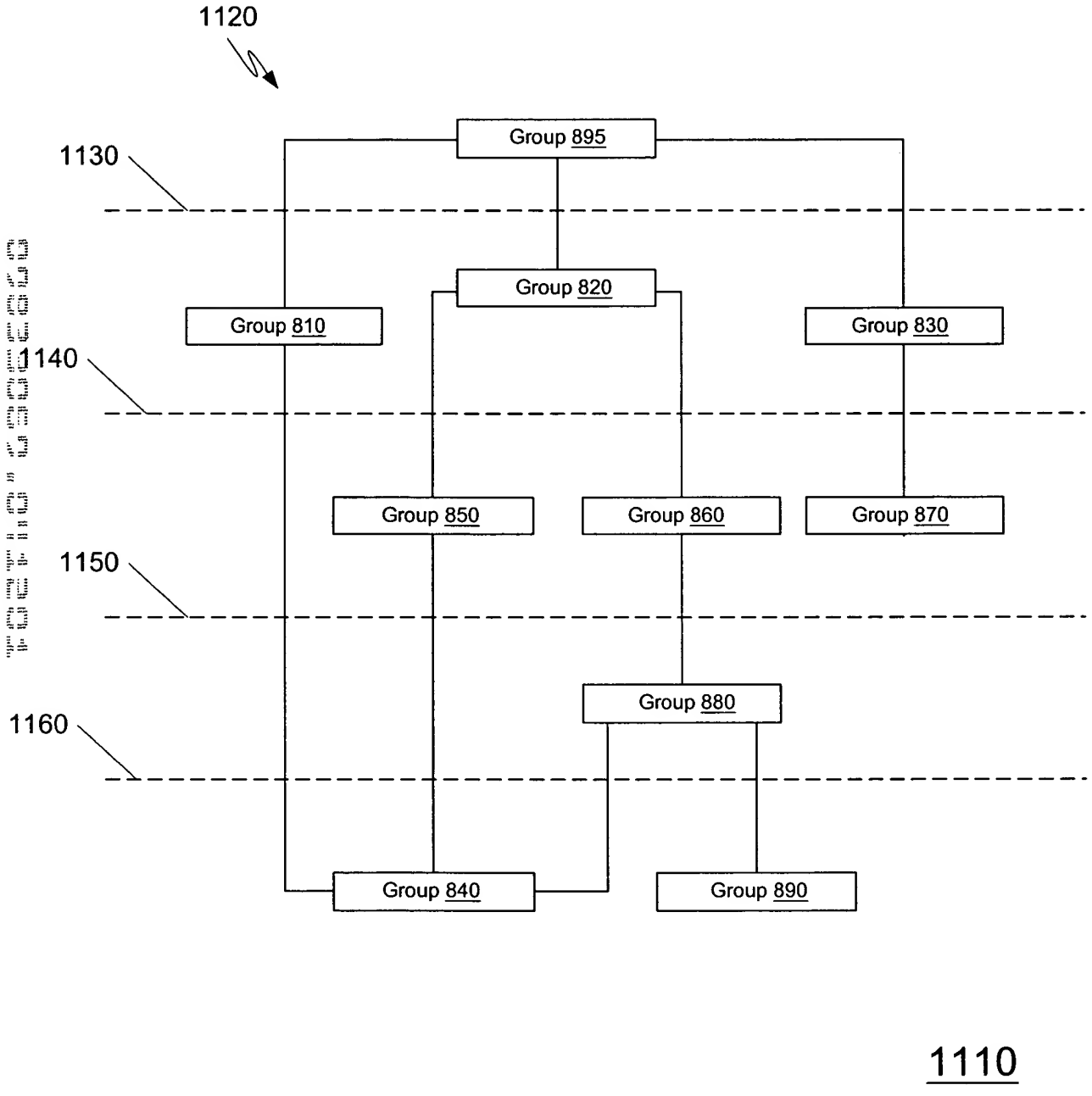

1120
1130
1140
1150
1160
Group 895
Group 820
Group 810
Group 830
Group 850
Group 860
Group 870
Group 880
Group 840
Group 890
1110

Fig. 11B

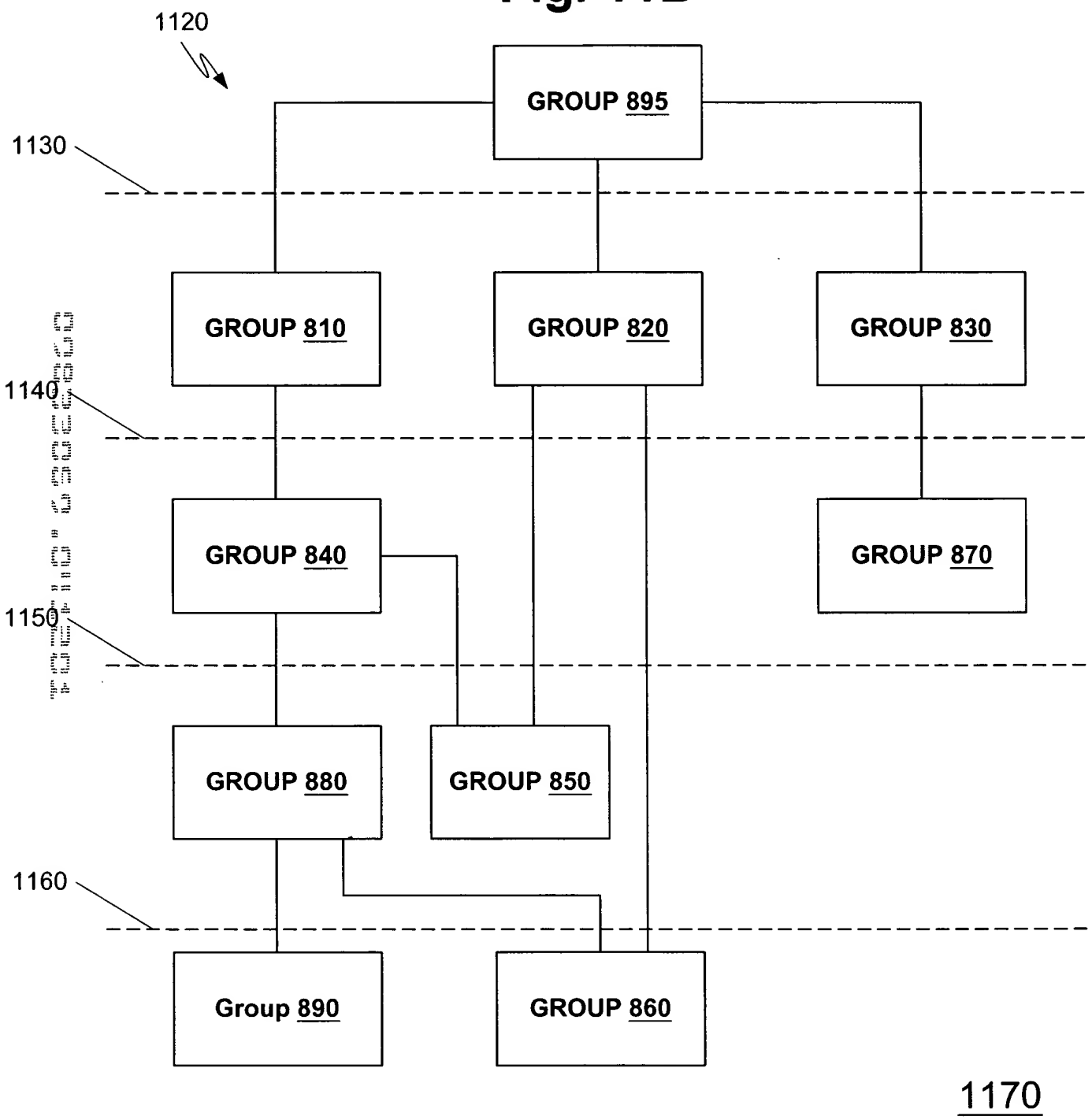

1120
GROUP 895
1130
GROUP 810
GROUP 820
GROUP 830
1140
GROUP 840
GROUP 870
1150
GROUP 880
GROUP 850
1160
Group 890
GROUP 860
1170

FIG. 11C

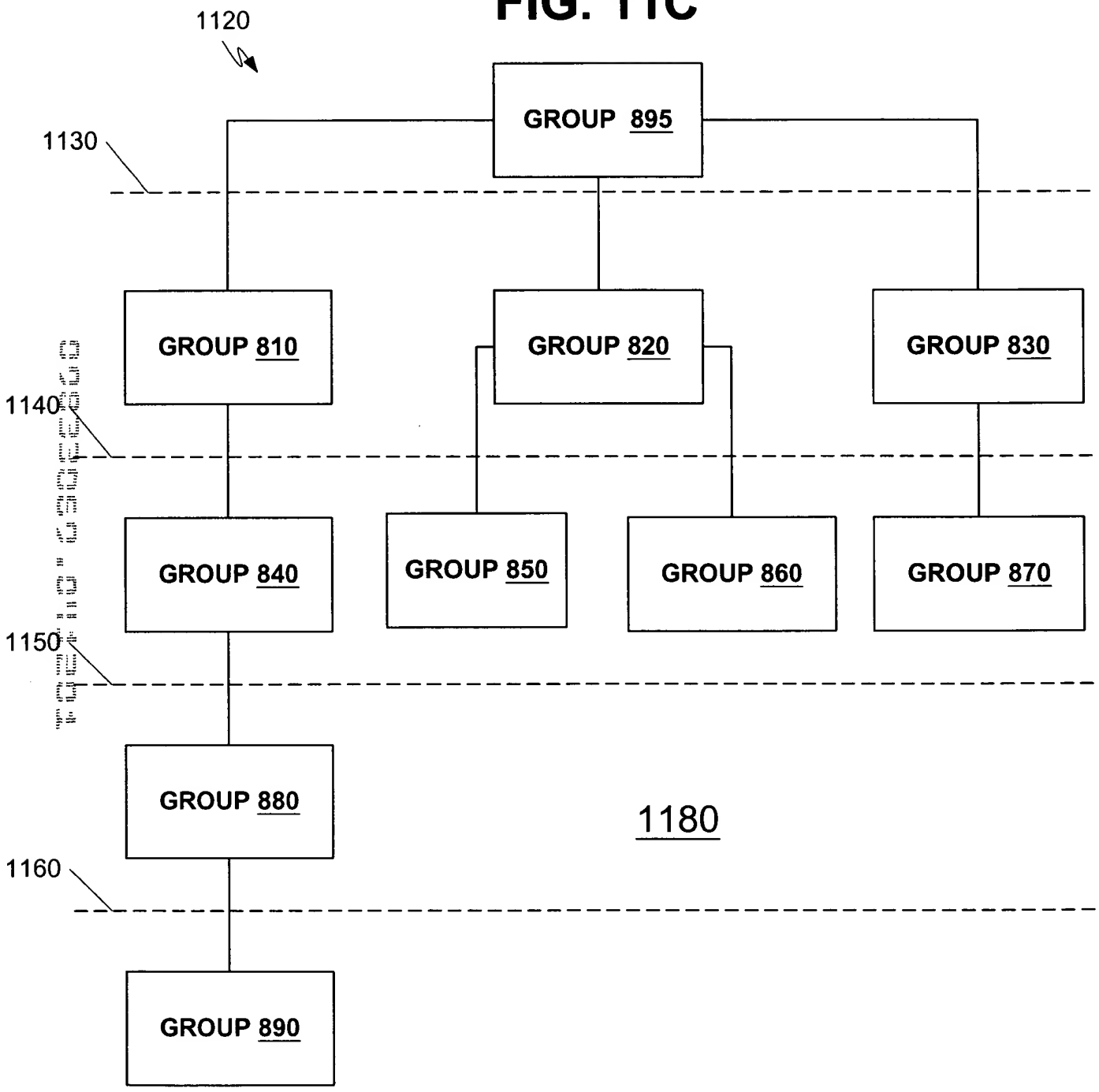

1120
GROUP 895
1130
GROUP 810
GROUP 820
GROUP 830
1140
GROUP 840
GROUP 850
GROUP 860
GROUP 870
1150
GROUP 880
1180
1160
GROUP 890

FIG. 11D

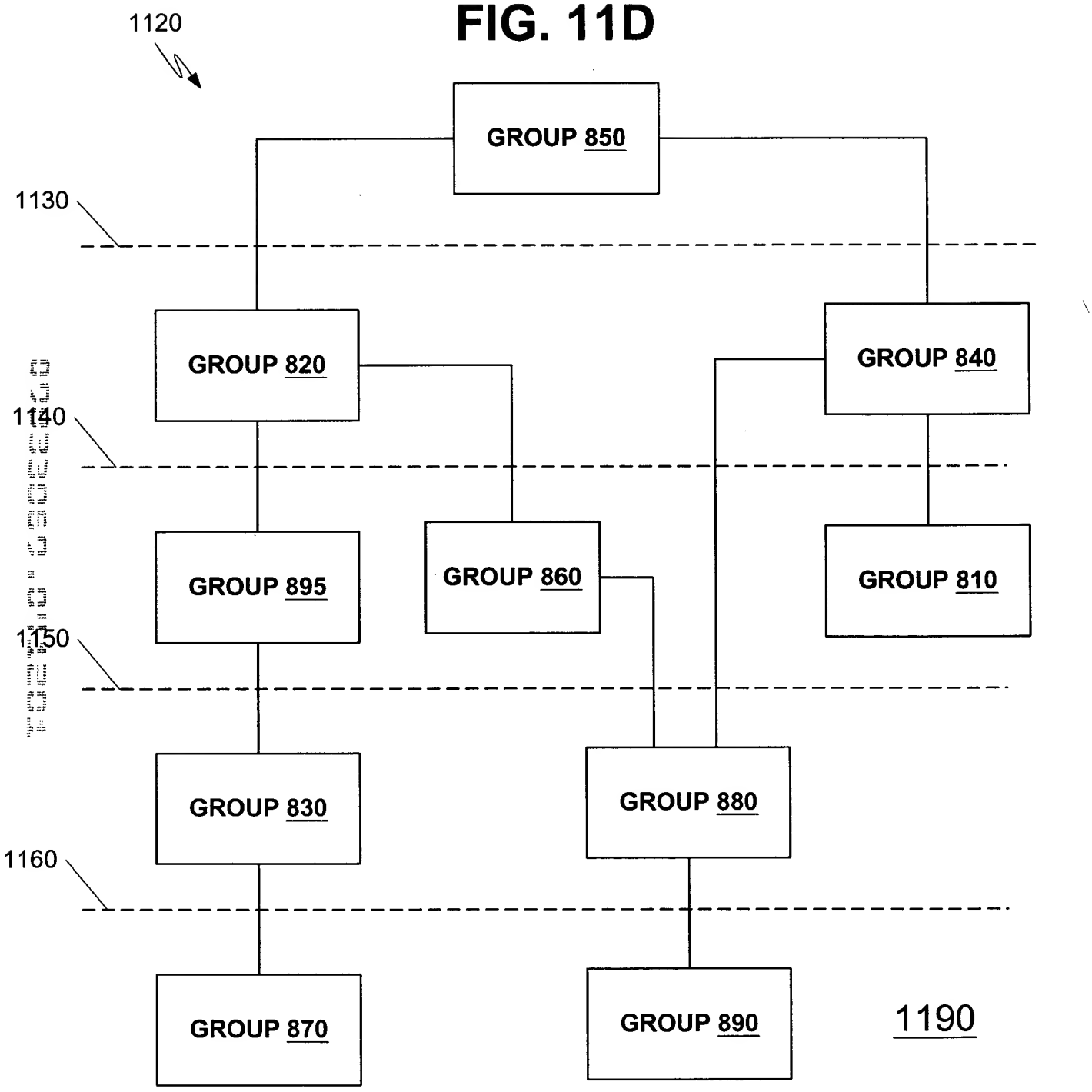
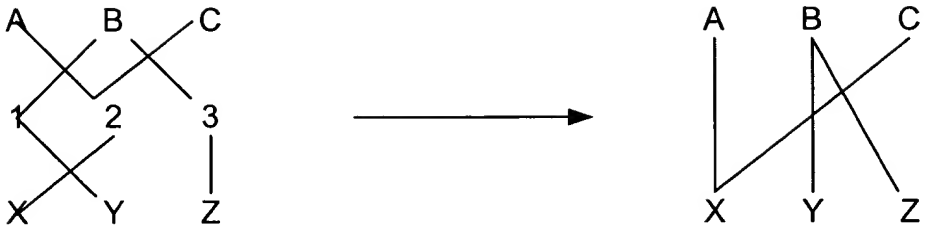

1120
GROUP 850
1130
GROUP 820
GROUP 840
1140
GROUP 895
GROUP 860
GROUP 810
1150
GROUP 830
GROUP 880
1160
GROUP 870
GROUP 890
1190

Fig. 12



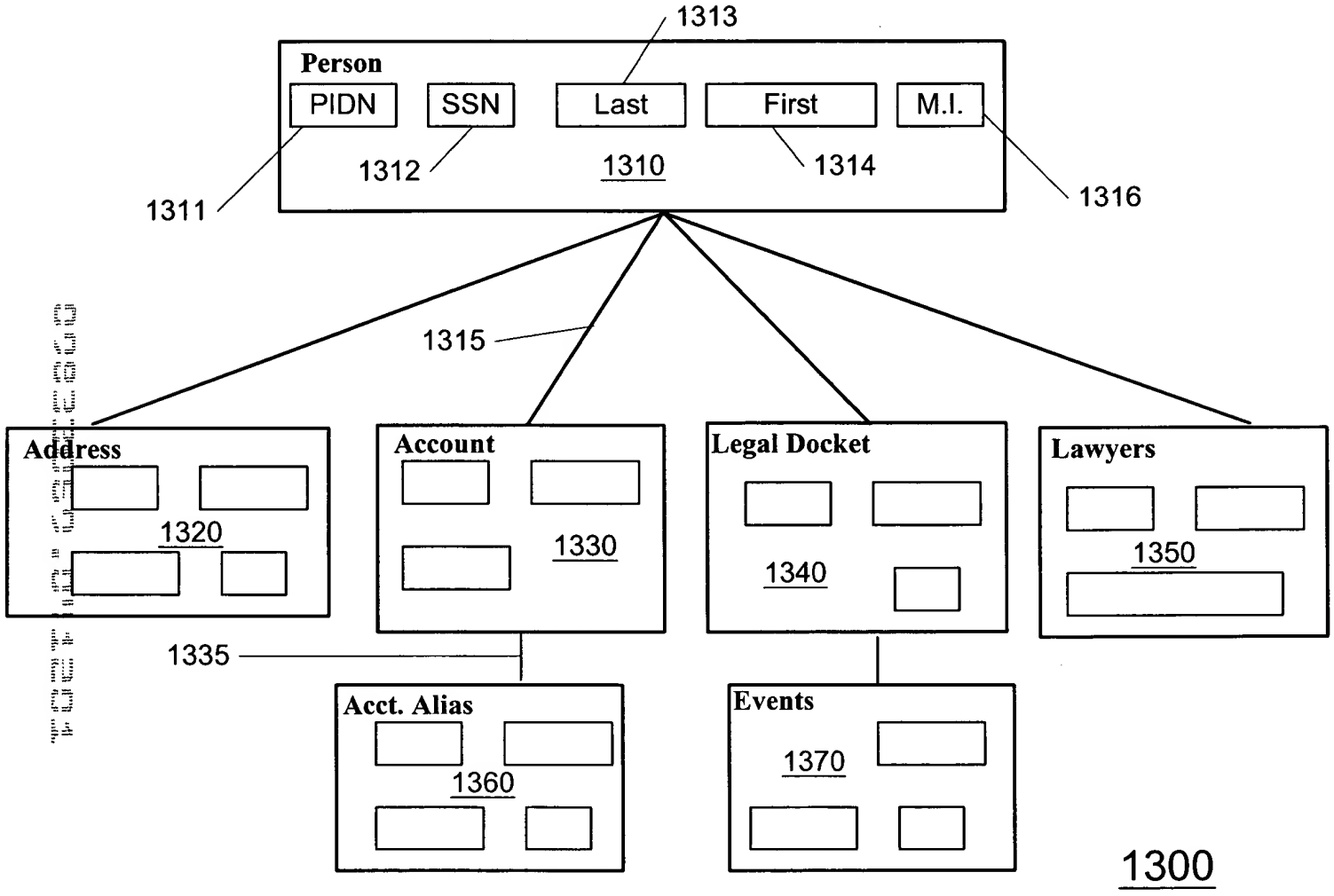

1313
Person
PIDN
SSN
Last
First
M.I.
1312
1310
1314
1311
1316
1315
Address
1320
Account
1330
Legal Docket
1340
Lawyers
1350
1335
Acct. Alias
1360
Events
1370
1300

Fig. 13

FIG. 14

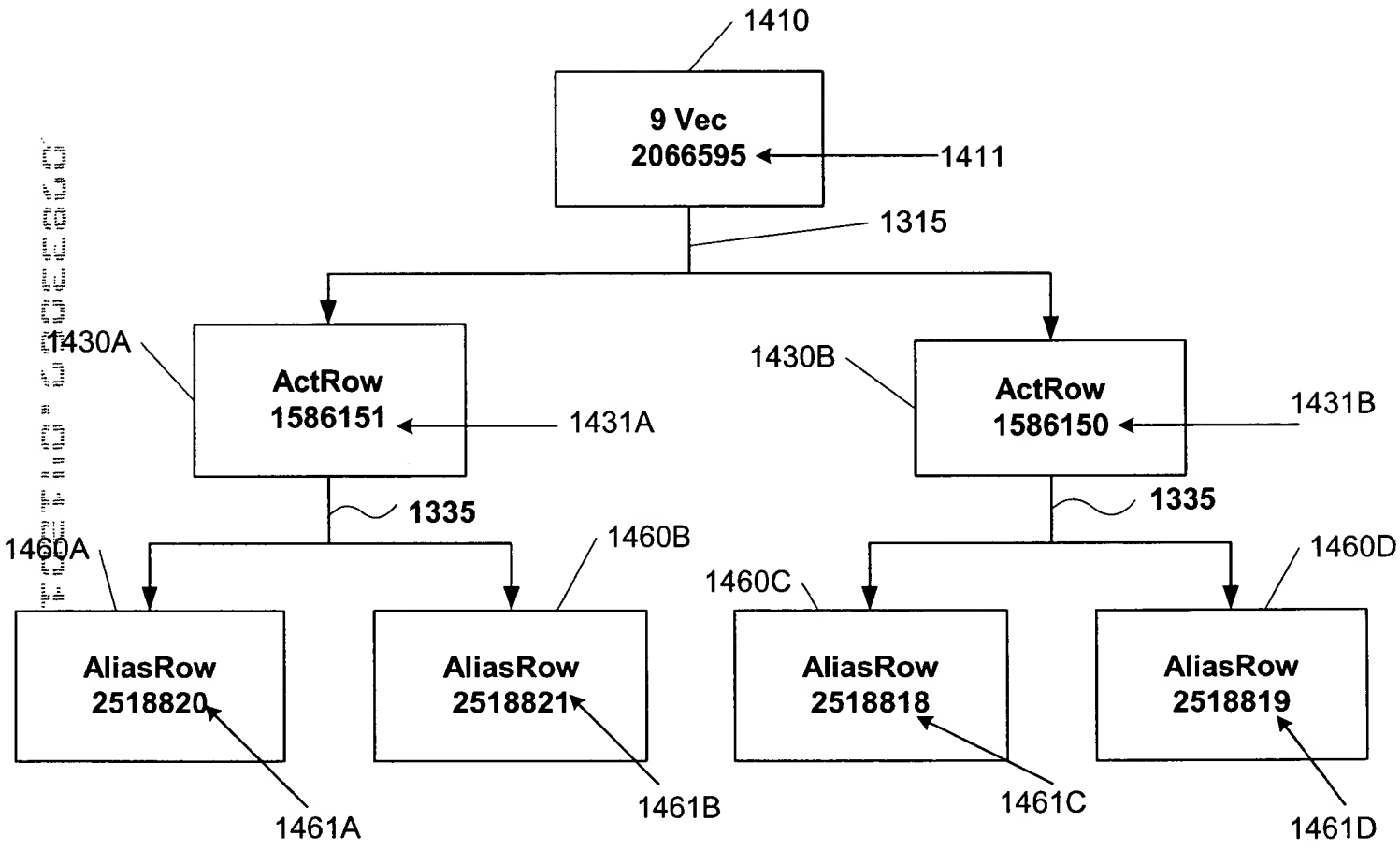

1410
9 Vec
2066595
1411
1315
1430A
ActRow
1586151
1431A
1430B
ActRow
1586150
1431B
1335
1335
1460A
1460B
1460C
1460D
AliasRow
2518820
AliasRow
2518821
AliasRow
2518818
AliasRow
2518819
1461A
1461B
1461C
1461D

FIG. 15

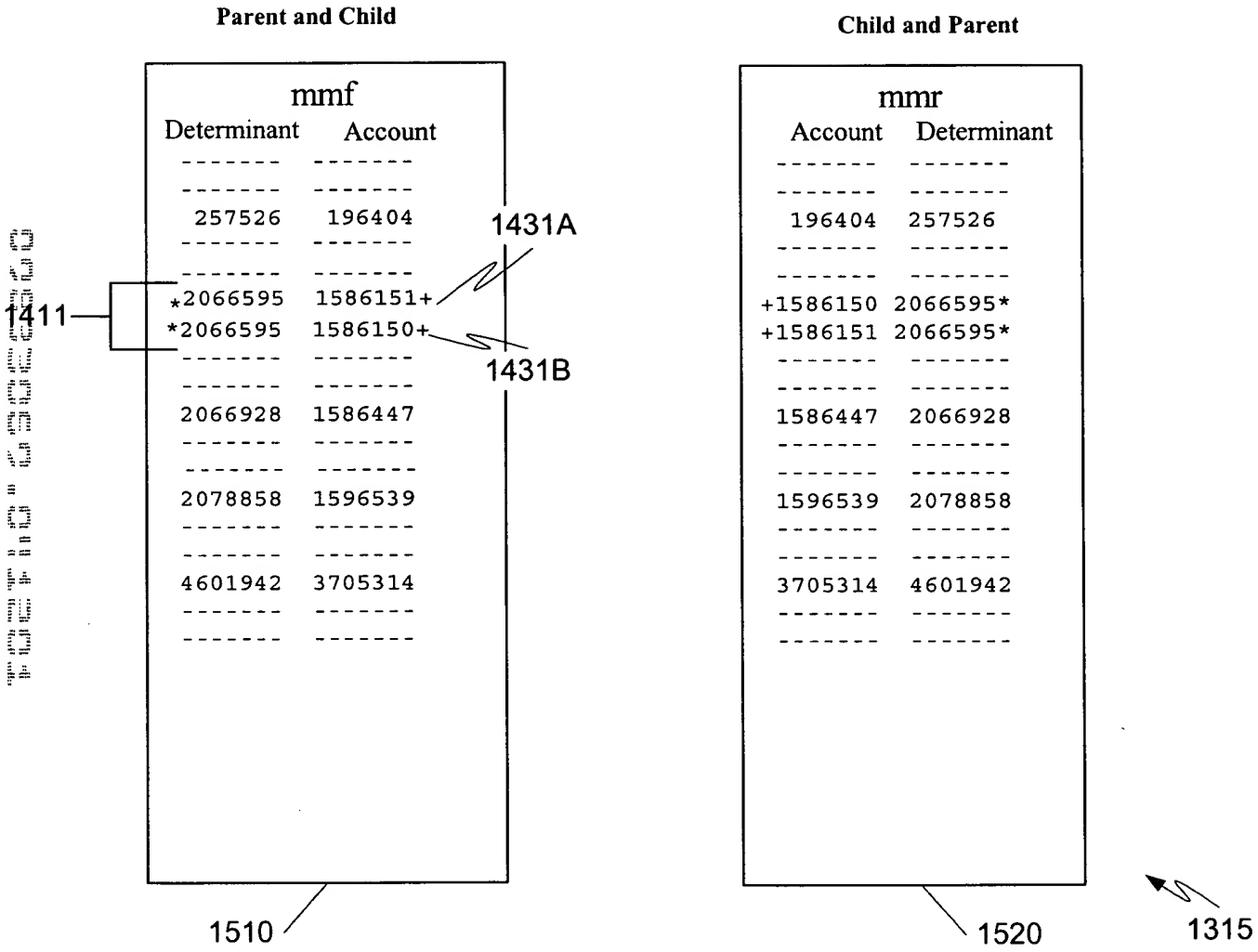
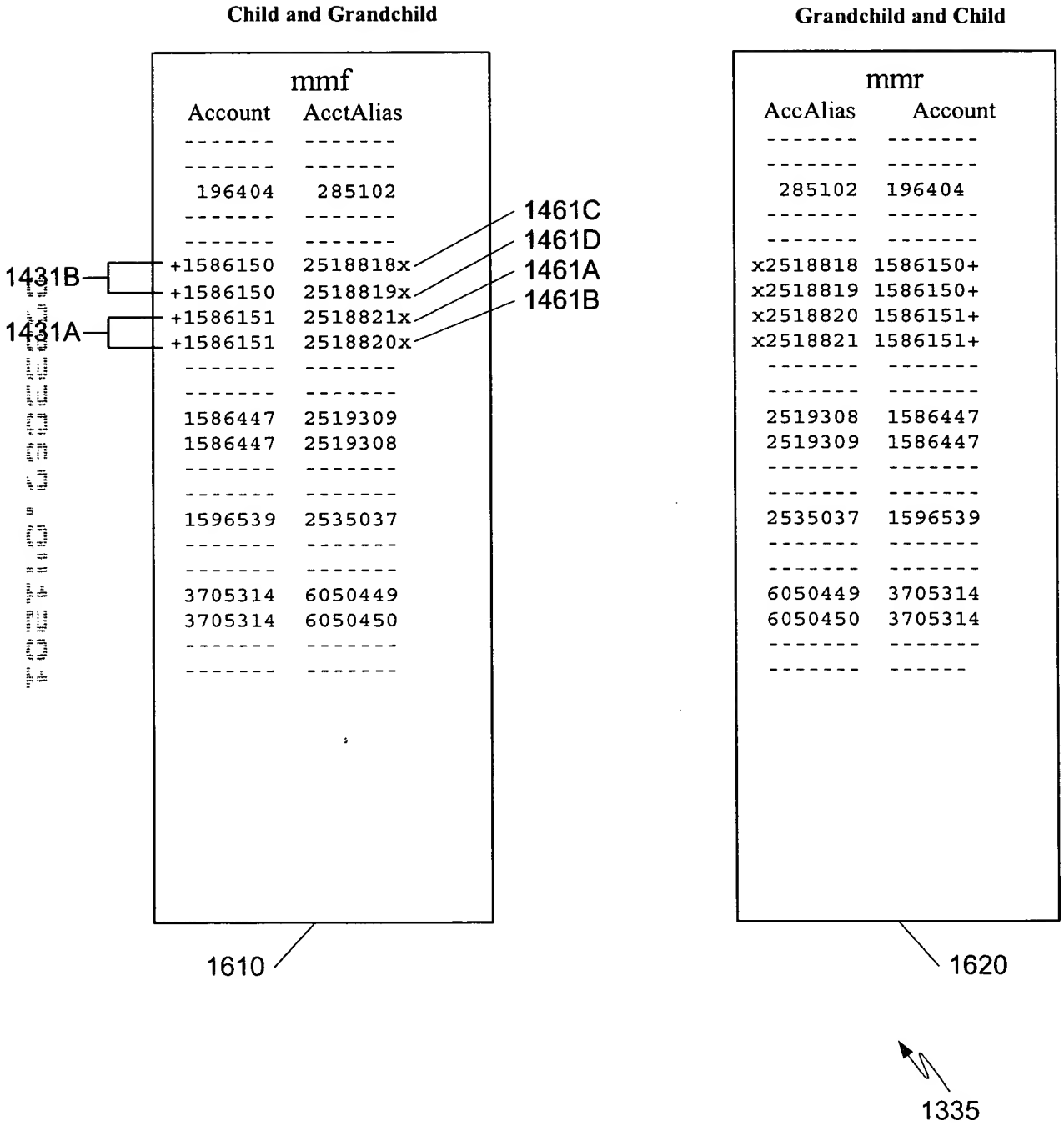
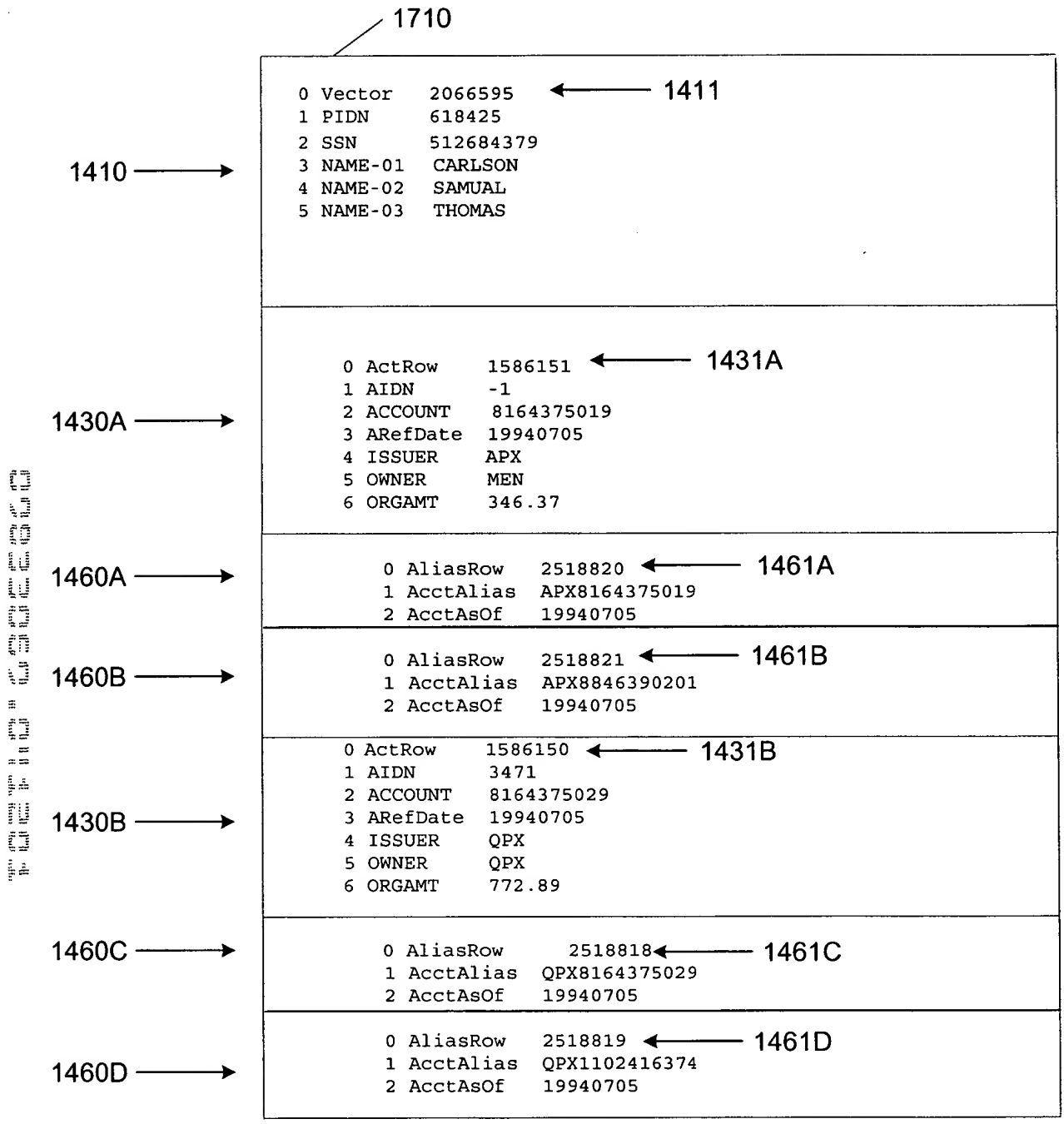

Parent and Child
mmf
Determinant Account
257526 196404
*2066595 1586151+
*2066595 1586150+
2066928 1586447
2078858 1596539
4601942 3705314
1411
1431A
1431B
1510
Child and Parent
mmr
Account Determinant
196404 257526
+1586150 2066595*
+1586151 2066595*
1586447 2066928
1596539 2078858
3705314 4601942
1520
1315

FIG. 16


Child and Grandchild
mmf
Account AcctAlias
196404 285102
+1586150 2518818x
+1586150 2518819x
+1586151 2518821x
+1586151 2518820x
1586447 2519309
1586447 2519308
1596539 2535037
3705314 6050449
3705314 6050450
1431B
1431A
1461C
1461D
1461A
1461B
1610
Grandchild and Child
mmr
AccAlias Account
285102 196404
x2518818 1586150+
x2518819 1586150+
x2518820 1586151+
x2518821 1586151+
2519308 1586447
2519309 1586447
2535037 1596539
6050449 3705314
6050450 3705314
1620
1335


1710
0 Vector 2066595
1411
1 PIDN 618425
2 SSN 512684379
1410
3 NAME-01 CARLSON
4 NAME-02 SAMUAL
5 NAME-03 THOMAS
0 ActRow 1586151
1431A
1 AIDN -1
1430A
2 ACCOUNT 8164375019
3 ARefDate 19940705
4 ISSUER APX
5 OWNER MEN
6 ORGAMT 346.37
0 AliasRow 2518820
1461A
1460A
1 AcctAlias APX8164375019
2 AcctAsOf 19940705
0 AliasRow 2518821
1461B
1460B
1 AcctAlias APX8846390201
2 AcctAsOf 19940705
0 ActRow 1586150
1431B
1 AIDN 3471
2 ACCOUNT 8164375029
1430B
3 ARefDate 19940705
4 ISSUER QPX
5 OWNER QPX
6 ORGAMT 772.89
0 AliasRow 2518818
1461C
1460C
1 AcctAlias QPX8164375029
2 AcctAsOf 19940705
0 AliasRow 2518819
1461D
1460D
1 AcctAlias QPX1102416374
2 AcctAsOf 19940705

1700

FIG. 17

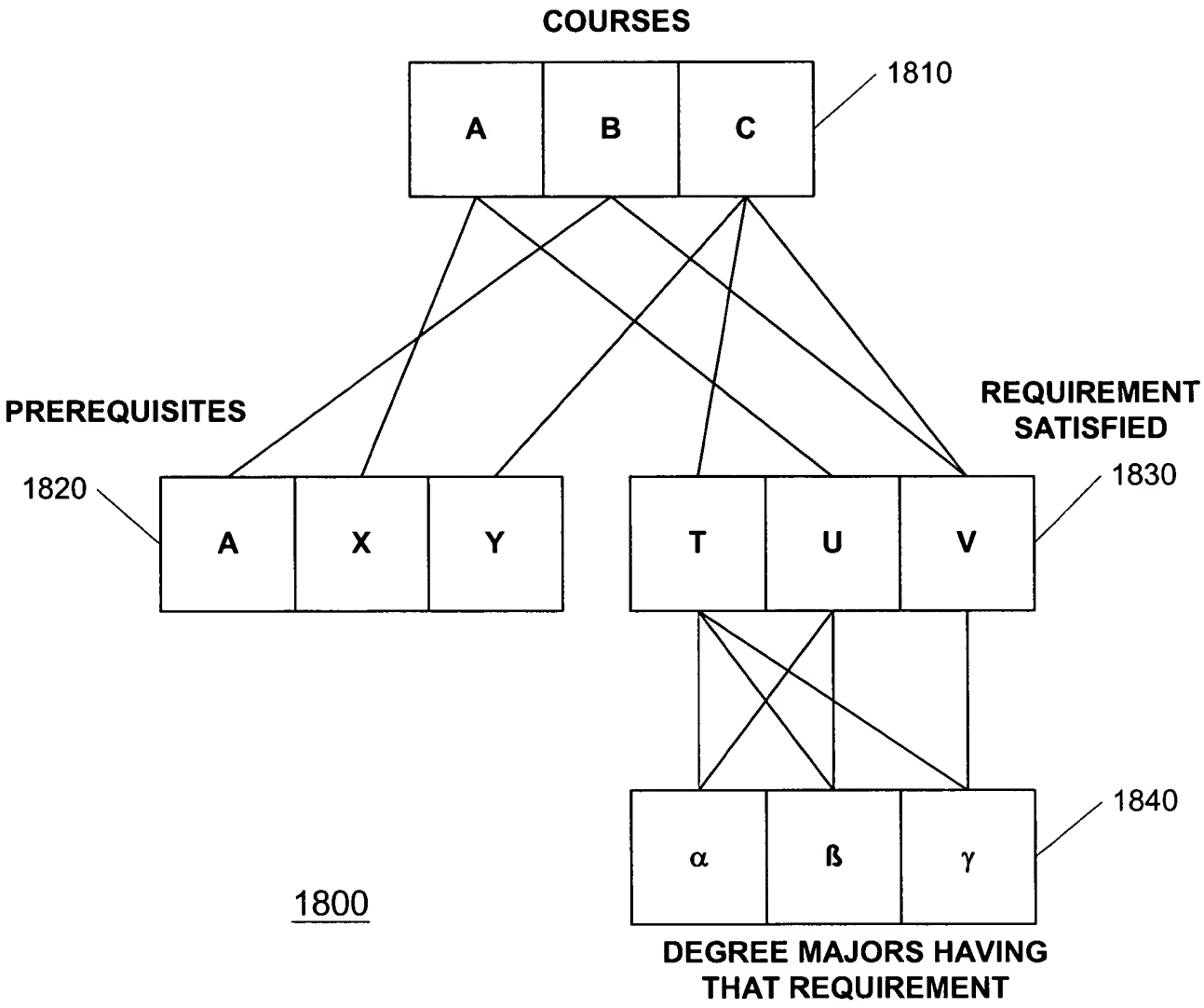

COURSES
1810
A
B
C
PREREQUISITES
REQUIREMENT SATISFIED
1820
1830
A
X
Y
T
U
V
1840
α
ß
γ
1800
DEGREE MAJORS HAVING THAT REQUIREMENT

FIG. 18

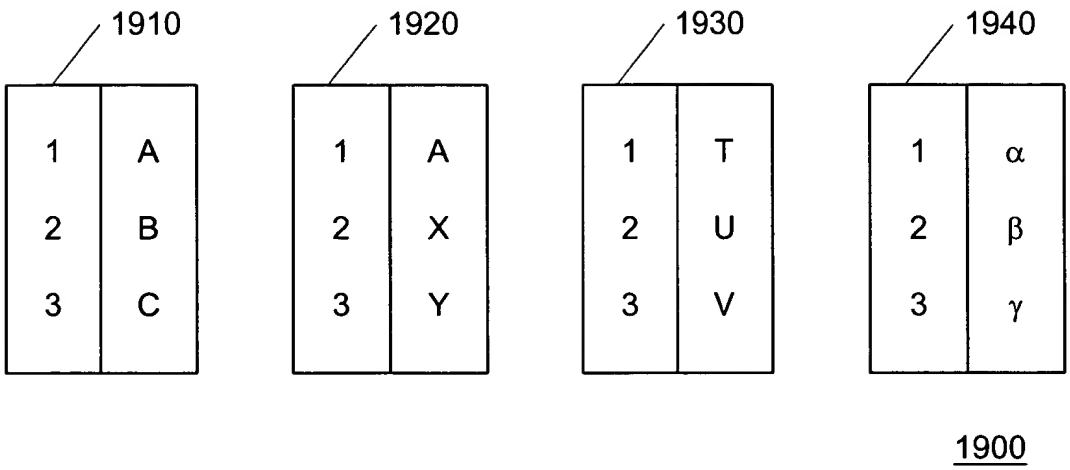


FIG. 19

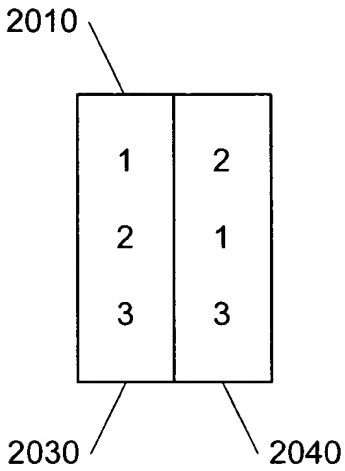


FIG. 20A

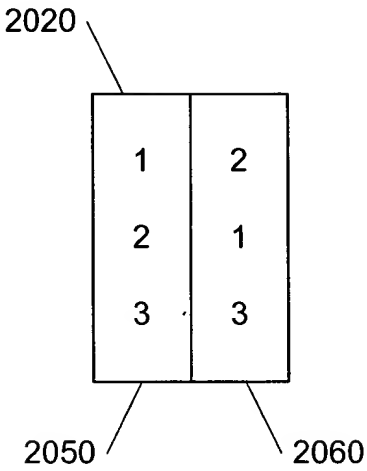


FIG. 20B

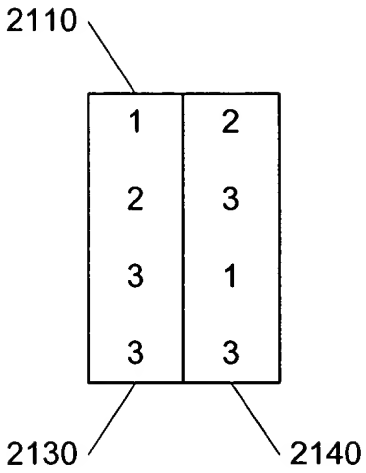


FIG. 21A

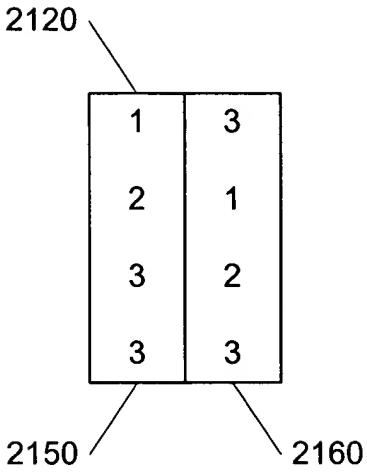


FIG. 21B

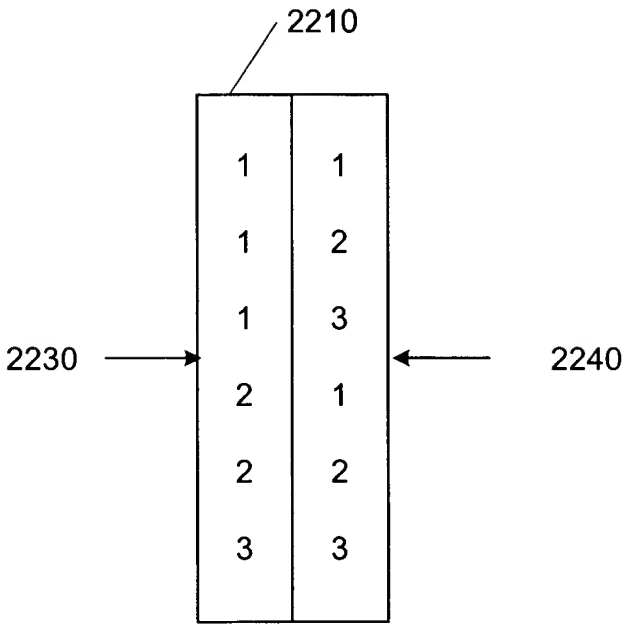


FIG. 22A

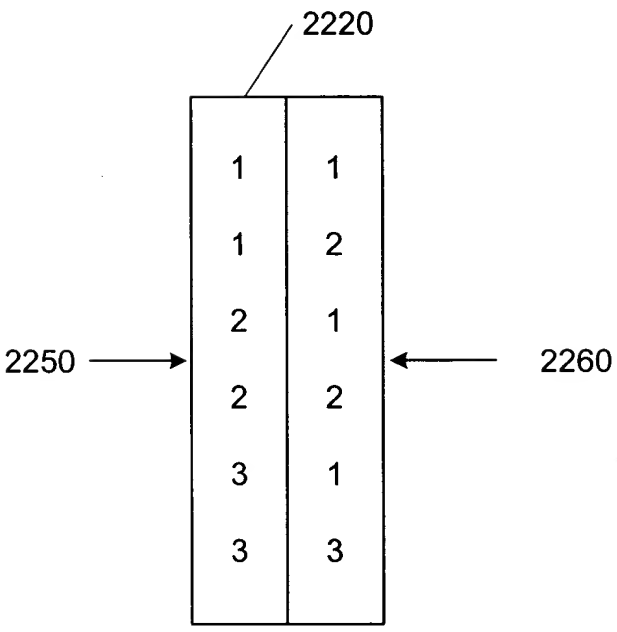


FIG. 22B

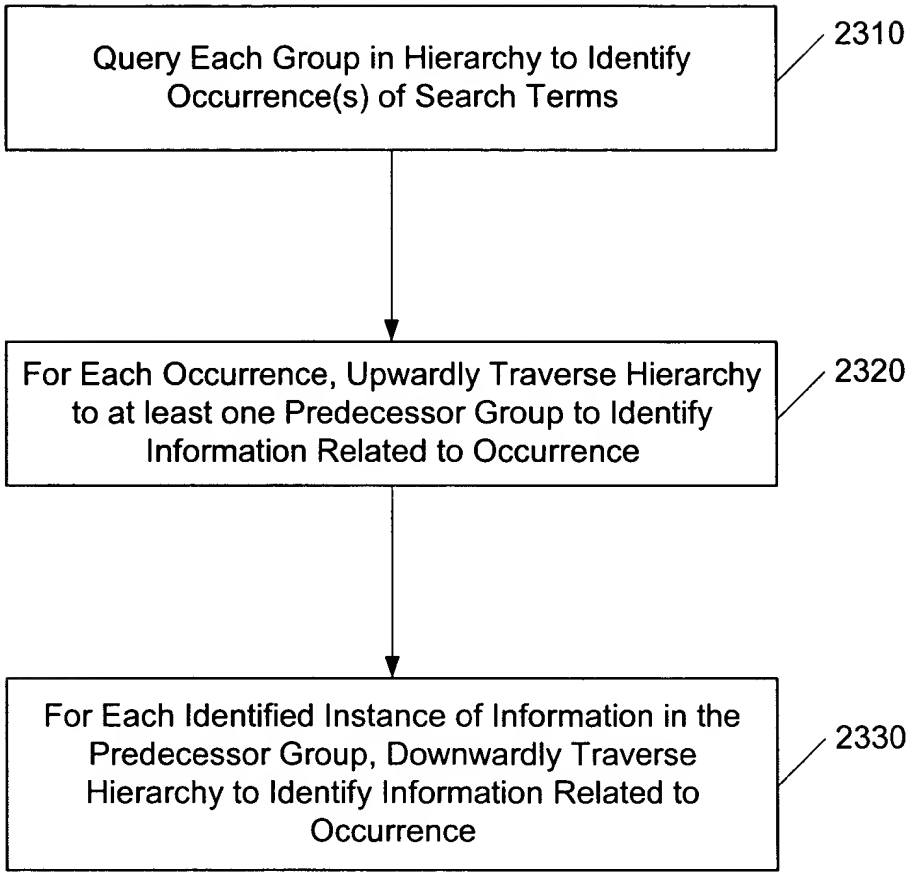

Query Each Group in Hierarchy to Identify Occurrence(s) of Search Terms
2310
For Each Occurrence, Upwardly Traverse Hierarchy to at least one Predecessor Group to Identify Information Related to Occurrence
2320
For Each Identified Instance of Information in the Predecessor Group, Downwardly Traverse Hierarchy to Identify Information Related to Occurrence
2330
2300

FIG. 23

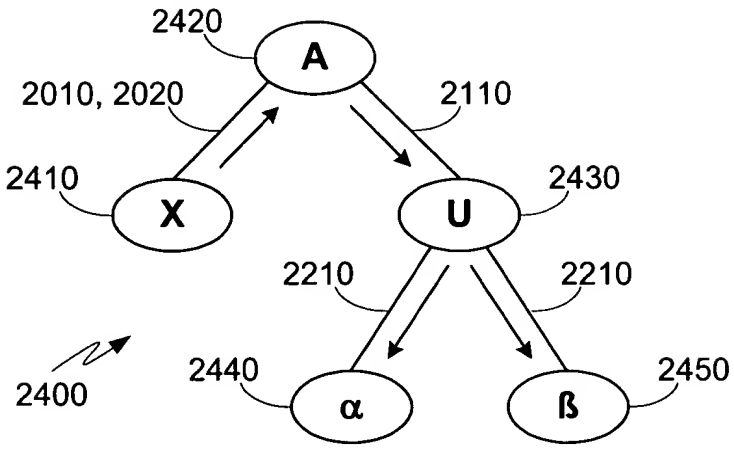

2420
A
2010, 2020
2110
2410
X
U
2430
2210
2210
2400
2440
α
ß
2450

FIG. 24

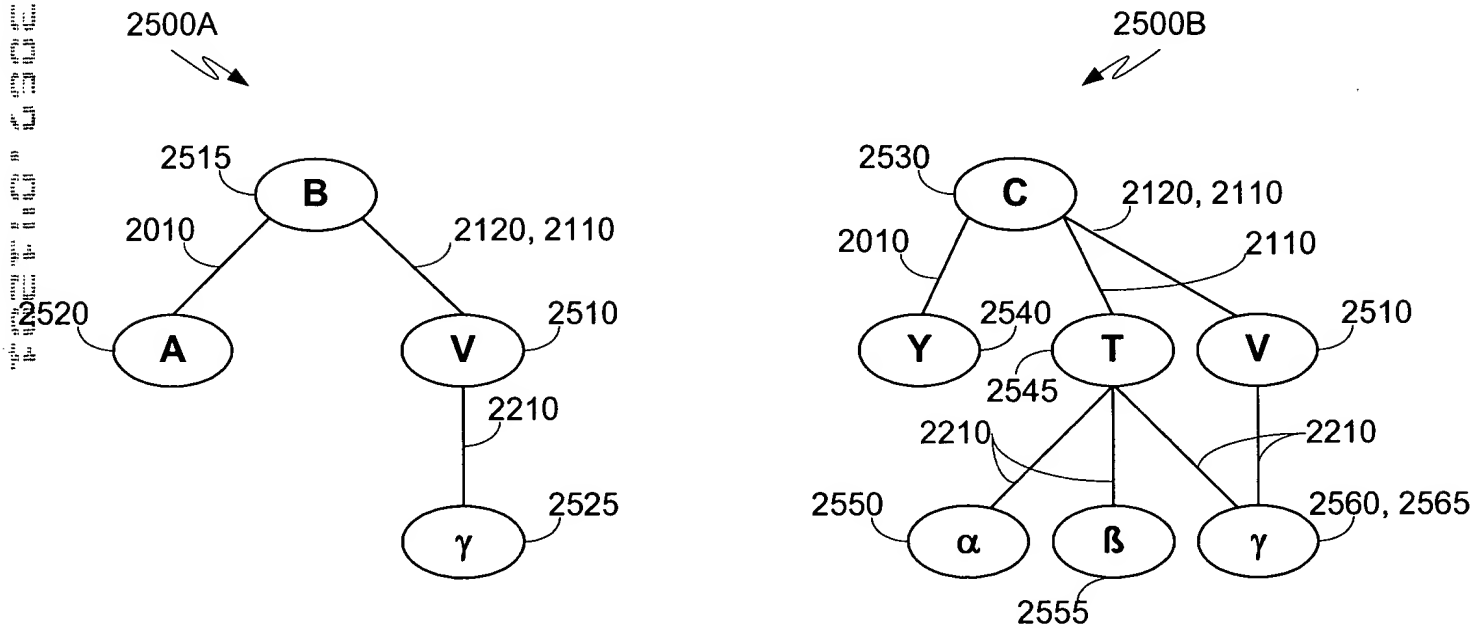

2500A
2515
B
2010
2120, 2110
2520
A
V
2510
2210
γ
2525
2500B
2530
C
2120, 2110
2010
2110
Y
2540
T
V
2510
2545
2210
2210
2550
α
ß
γ
2560, 2565
2555

FIG. 25